DOCUMENT RESUME

ED 195 677 CE 026 943

AUTHOR Newsom, Ron
TITLE In Quest of Knowledge: Adult Education in Sixteenth Century England and Its Relation to the Origins of the "Modern Era" of Adult Education.
PUB DATE 5 Nov 80
NOTE 35p.: Paper presented at the National Adult Education Conference (St. Louis, MO, November 5, 1980).

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adult Education; *Cultural Influences; *Educational History; Educational Innovation; *Foundations of Education; History; Information Dissemination; Literacy; Literature Reviews; Printing; Technology
IDENTIFIERS *England; Protestant Reformation; *Sixteenth Century

ABSTRACT

If less formal, self-motivated learning is accepted as a definition, adult education can be traced back to sixteenth century England, not merely to nineteenth century England as Verner, Trevelyan, and others have contended. The two factors which gave the greatest impetus to adult education in the sixteenth century were the Protestant Reformation and printing. The Reformation established a value system that required literate adults, while the development of printing provided the means to disseminate information to adults who were literate. Other major factors in the origin of adult education are the contributions of several scholars, lecturers and teachers, the Society of Antiquaries, and Gresham College. Three men, Robert Recorde, John Dee, and Thomas Hood, contributed to the education of adults through teaching in English and the popularization of mathematics and science, especially the applied principles needed by navigators and builders. The Society of Antiquaries (1572-1604) promoted the study of English history and the collection of items related to English antiquities. Gresham College began in 1596 and provided lectures in London by the most renowned scholars of the day. It was more an extension of the universities of Oxford and Cambridge than a competitor of them, and drew audiences from the middle as well as upper classes. Just as the sixteenth century was a new era, with the dawn of printing, the late twentieth century may be the dawn of new forms of adult education because of the rise of electronic information processing. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED195677

IN QUEST OF KNOWLEDGE: ADULT EDUCATION IN SIXTEENTH CENTURY ENGLAND AND ITS RELATION TO THE ORIGINS OF THE "MODERN ERA" OF ADULT EDUCATION

by Ron Newsom
Adult/Continuing Education
College of Education
North Texas State University
Denton, TX 76201

A Paper Presented At The
National Adult Education Conference
St. Louis Missouri
November 5, 1980

CE026943

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

©1980

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Ron Newsom

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Released for ERIC
Ron Newsom 12/5/80

IN QUEST OF KNOWLEDGE:
ADULT EDUCATION IN SIXTEENTH CENTURY ENGLAND
AND ITS RELATION TO THE ORIGINS OF THE "MODERN ERA"
OF ADULT EDUCATION

Origins of the Modern Era of Adult Education

In Verner's facsimile of Thomas Pole's History of Adult Schools, Verner observes that although the exact origins of adult education in England are obscure, the first organization established solely to promote the education of adults in Britian was the Bristol Institution for Instructing Adult Persons to Read the Holy Scriptures in 1812 in Bristol, England (Verner, 1967, pp. 4-8). The underlying motive for this institution, says Verner, was a religious and moral concern for individuals (p. 21). In taking this position Verner rejects the English historian, G. M. Trevelyan's observation (Trevelyan, 1942) that the impetus for adult education came from the mechanics institutes of the early 1800's in Britain. Verner observes that:

> In the sense in which we use the term adult education today, we would reject this hypothesis of Trevelyan in favor of the work of Pole and others in the adult school movement as originators of adult education and that the first impetus for adult education grew out of the religious movement rather than the scientific although the two movements were parallel developments. (Verner, 1967, p. 3)

How is Verner using the concept adult education? Regrettably, he does not clarify his position in the introduction to Pole's book. The reader must assume that Verner is refering to his definition of adult education which he defined elsewhere as:

> Adult education is a relationship between an educational agent and a learner in which the agent selects, arranges, and continuously directs a sequence of progressive tasks that provide systematic experience to achieve learning for those whose participation in such activities is subsidiary and supplemental to a primary productive role in society. (Verner as quoted by Schroeder, 1970, pp. 39-40)

Thus, according to Verner to qualify as adult education there must be an educational agent who selects and arranges a series of progressive tasks to provide systematic experience, and the learner's role in society should be that of worker or producer of services. Therefore, Verner must have rejected Trevelyan's mechanics institutes because the membership was involved in the development of instruction and in the selection of instructors and because the learning was not necessarily a series of progressive tasks to provide systematic experience. However, in Trevelyan's view the mechanics institutes clearly are instances of adult education.

Verner says that the publication of the first edition of Pole's book marks the beginning of the modern era in education by acknowledging the importance of adult education within all of education (Verner, 1967, p. 1). This book, according to Verner, established the discipline adult education because it provided insight to methods, problems encountered, and operations of adult schools; and it served along with the promoters of the institution as a model for other towns to establish schools for adults (Verner, 1967, p. 37). Also, it was the first time that the term adult education was used (Verner, 1967, p. 37).

Therefore, Verner's argument is that the Bristol adult school represents a new institutional form within education and that Pole's book reflects the earliest known text on the discipline that treats

adult education methods and practice. He places the impetus to this in a religious, moral context as opposed to an economic, scientific context, eventhough, as he says both were paralled developments. It should be remembered that the early 1800's represent a time when support for more youth education was developing. Lawrence Stone has observed that "the most powerful argument behind the extension of education (for youth) around 1800 was that it could be used as a means of social control" (Stone, 1969, p. 91). To what extent could this same motive have also affected the Bristol adult school movement? Apparently, to date, the question has not been explored; therefore, we must assume that the stated reason of the Bristol Society, religious and moral, were the actual reasons and not only the public reasons. However, the assumption may not be totally valid. Religious motives only, apart from economic, social, scientific motives to adult literacy seem more credible in the sixteenth century in England. Trevelyan in his England Under the Stuarts notes that what he calls the second puritanism or evangelical revival in England was " a weakly imitation of the first which had humanitarian activity as its great merit" (Trevelyan, 1922, p. 34). The extent to which the Bristol schools for adults represent a humanitarian act has not been examined.

Actually, the complete title of Pole's book suggests the moral and social implications for teaching reading to adults that will accrue to the moral character of the clients and that will benefit society and does not imply or state a relation between teaching reading of the scriptures and salvation. The complete title is: A History of the Origin and Progress of Adult Schools, With an Account of Some of the Beneficial Effects Already Produced on the Moral Character of the

Labouring Poor; Also Considerations on the Important Advantages They are Likely to be Productive of to Society at Large. And finally, pinpointing religious motives as the major motives might in this case be as difficult as the present case of the Moral Majority. The Moral Majority seems to be promoting political involvement from the perspective of a religious group and in their rhetoric do not directly relate their political activitism to the salvation of man, but imply it only; therefore, is the Moral Majority operating from religious motives or political motives? The common bond among the members are religious affiliation, religious values, and the agreement on the need for political change. To what extent then is the Bristol adult school movement a religious group that operated out of a religious, philosophical base but promoted social humanitarian principles as much as religion?

Verner notes that the Bristol schools quickly began to wan and that by 1839 most had disappeared (Verner, 1967, p. 18). His argument for the modern era beginning with the Bristol adult schools in 1812 is strongest when based on the idea that this represents the first modern institutional form within Verner's definition of adult education to teach reading literacy to adults. Verner clarifys his position in his preface to Duncan Campbell's Adult Education as a Field of Study and Practice where Verner observes:

> The provision of opportunities for adults to engage in education continuously has been characteristic of every culture. In most cases, these provisions have been so pervasive and so varied that they are not often recognized as educational; consequently, they have long been ignored. . . But, Pole was the first to note the phenomenon of adult education and its role in society . . . and he coined the term adult education. (Campbell, p. vii)

The second major point of Verner's case rests on the argument that Pole represented the origins of the discipline, adult education. But, can the mechanics institutes as an adult education institutional form be ignored, and to what extent is the institutional form of the mechanics institutes older or younger historically, than the Bristol type schools for adults?

Grattan and the Modern Era of Adult Education

Hartley Grattan in The Quest of Knowledge indicates that the first reference to adult education in modern England is in the minutes of the Society for the Propagation of Christian Knowledge in 1698 (Grattan, 1955, p. 67). Grattan's definition of adult education is that of Bryson who defined it as "All activities with an educational purpose that are carried on by people engaged in the ordinary business of life" (Grattan, 1955, p. 3). The essential aspects of adult education according to Bryson and Grattan are: the activities be purposefully educational; the clientele are adults, and clients are engaged in their ordinary routine in addition to the education. Grattan uses this definition to identify and to discuss what he calls conscious ventures in adult education and concludes that "British adult education had its origin in sporadic, religiously inspired, philanthropic efforts during the eighteenth century to teach poor working people to read . . ." (Grattan, 1955, p. 75).

Grattan notes that adult education is always dependent on leisure time except for on-the-job adult education. He says "historically . . . adult education began its modern career in a period when leisure was largely an upper class possession, and the fact that most people

had little leisure made their use of any part of it for adult education highly remarkable" (Grattan, 1955, p. 9).

Yet, Grattan and Verner both apparently do not seek to determine to what extent leisure time was used for adult education by the upper and middle classes. But instead, they identify the modern origins with a situation where the upper and middle classes started instruction for illiterate adults who had very little leisure time. Possibly, our notions about leisure time and its use are not based on a good deal of evidence but are based on conjecture and speculation. For example, I believed that in fourteenth century England the working class had little or no leisure time and that only the upper class had time that could be designated as leisure; although for the upper class, it may be more difficult to distinguish among leisure, work, and responsibilities. In other words leisure is what a worker does when he is not working, and the upper class is not frequently thought of as workers. But, James Burke in his book Connections briefly describes a fourteenth century adult training problem based on the use of leisure time on Sundays. Burke says that:

> . . . in 1365 Edward III issued a proclamation against 'whoring' in the fields, and against time wasted evilly in pastimes such as dicing, football, dancing, and playing games on Sundays. The real problem for those in power was that these new habits detracted from the one legal activity for a Sunday (besides prayer) which was practice at the archery butts. It took years for a man to be trained to use the six-foot yew bow, and here was the adult male population frittering away valuable training hours enjoying itself . . . (Burke, 1978, p. 66)

Maybe the extent and use of leisure time available to adults historically is different from what we imagine it to have been.

And finally Grattan identifies another aspect typical to modern adult education, an aspect that Verner agrees with, when Grattan says " . . . One aspect of modern adult education has been a fairly constant awareness of the point that to teach adults successfully, methods understandingly adapted to adults must be employed" (Grattan, p. 14).

To a degree, the issue of the modern beginnings of adult education grows out of a distinction between adult education and the education of adults. Are these concepts synonymous or do they have different meanings? Adult education usually suggests the formal organization of agencies or institutions to provide education for adults; whereas, the education of adults implies a perspective that examines those means used by adults to acquire knowledge or skills and, therefore, does not only concentrate on formal organizations. Adult educators are not in agreement on the use of these two concepts, but Grattan and Verner's historical perspectives use the former concept of adult education from an agency or institutional perspective. Interestingly, Allen Tough's research has suggested that approximately 20% of all adult education occurs in an agency setting. Therefore, Grattan and Verner do not deal with the historical development of the 80% of adult learning which supposedly goes on through self directed study. If we accept Tough's evidence as fact for this century and for prior centuries, then one might speculate that the 20% in institutions in the twentieth century would diminish as one examined each earlier century and that the level of self directed learning might increase. This question needs to be studied historically. Grattan does observe that prior to the eighteenth century adult education ". . . appears

to have been left to the operation of those forces at large in society at all times and places which tend to form the minds of mature people" (Grattan, 1955, p. 23). But these forces have not been clearly identified, and we do not know which ones are typical of all centuries, and if they vary according to values, economics, politics and culture.

The Impact of Religious Values in Sixteenth Century England on Adult Education

The religious incentive, to the extent that it was strictly a religious incentive, to adult education described by Grattan and Verner did not originate in the eighteenth century, but the religious values and motives first developed and were widely applied in sixteenth century England. Secondly, the technical and industrial motives suggested by Trevelyan that led to the mechanics institutions were not original to the eighteenth century. Sixteenth century England represents the stirings of modern technology as a result of the acquisition of Arabic and Greek writings on science, math, astronomy, and as a result of development of technological advances in Europe and in England itself. Thus, to what extent did institutions and methods to promote adult education and learning in its modern sense occur in sixteenth century England and to what extend did the sixteenth century solution to adult learning needs serve as a foundation for later developments in adult education? There appear to be several factors in sixteenth century England that influenced and served as a means for adult education in institutional settings and for self directed learning. The intent of this portion of the paper is to examine the contribution of the following factors in England during

the 1500's: The religious impetus to adult learning; the printing of books; the contribution of several individuals as scholars, writers, lecturers, and teachers; the Society of Antiquaries; and Gresham College. These factors are arbitrarily selected and, therefore, represent only a limited number of possible considerations, but these are typical of the times.

The two factors which gave the greatest impetus to adult education in the sixteenth century and possibly the greatest influence on adult education between the sixteenth and into the twentieth century are the Protestant Reformation and printing. One established a value syste hat required literate adults, and the other provided the means to disseminate information to all adults who were literate. As Cremin has noted "Christianity has always been an educational system . . ." (Cremin, 1970, p. 138). But Protestantism came to the forefront in the sixteenth century, and as Lawrence Stone has indicated the Protestant movement particulary stressed Christianity as a religion of the book, and ". . . Once this book ceased to be a closely guarded secret fit only to be read by the priests it generated pressure for the creation of a literate society" (Stone, 1969, pp. 76-77). In the sixteenth century there was a continuious demand for the Bible and for devotional books based on the Bible. Over 200 editions of the Bible were published between 1521 and 1600 (Laqueur, 1976, p. 262). Until 1635, the Stationers' Company in England limited a single edition of a book to 1500 copies; after 1635 that amount was increased to 3000, but Bibles and school books were exempted from the limitations on an edition. Consequently, it is difficult to estimate the number of Bibles represented by these 200 editions. If each edition averaged

1000 copies, then there were at least 200,000 copies of the Bible printed during these years. If each edition averaged 1500 copies, then 300,000 Bibles were printed during 1521 to 1600. The population in England at this time has been estimated as having ranged from one and three fourths million persons to two million persons.

Within the context of the Protestant movement one person who made a major contribution to the value of educating adults and a contribution to the means to educate adults in England was William Tyndale. Tyndale who had been educated for the priesthood came to accept the protestant idea that each person should be able to read the scriptures and apparently believed that he had been called to translate the Bible into English. When he started the project he is reported to have said that, "Before many years he (Tyndale) would cause a boy that driveth the plough, to know more of the scripture than Tyndale did" (Cremin, 1970, p. 35). By 1525, he had completed the new testament in English and copies were being shipped to England. By 1534, he had completed the old testament. Apparently Tyndale's translation was widely circulated in England, and it was later used as one of a number of sources by the scholars authorized by James I to translate the Bible into English between 1603 and 1611. But, Tyndale's translation was attacked in England by church authorities who branded him a heretic "because the Bible in the hands of the untutored mob would only serve to disrupt the church" (Cremin, 1970, p. 37). Sir Thomas More was active in attacking Tyndale because of his unauthorized version in English. Finally, in 1536 Tyndale was executed and burned as a heretic. In 1538, Henry VIII who had opposed Tyndale's translation reversed himself

and proclaimed that an English translation of the Bible be placed in every church in the kingdom.

Unfortunatley, we have no accurate understanding of the extent to which Tyndale's Bible was read by the masses. There exist only some generalized indications regarding its impact such as the comment by Bishop Fox in 1537 who when speaking to members of the clergy said: "Make not yourselves the laughing-stock of the world; light is sprung up, and is scattering all the clouds. The lay people know the scriptures better than many of us" (Cremin, 1970, p. 36). Clearly, he may have been exaggerating the situation; yet, it does imply that the acceptance and reading of the English version must have been widespread. Cremin observes that Tyndale "using the language of the laity with remarkable artistry, had actually fashioned an extraordinarily powerful instrument of popular education, on which nearly all subsequent English versions of the Bible depended in some measure" (Cremin, 1970, p. 38). Tyndale is only one example of the impact of Protestant and later Puritan thought on literacy and the religious education of English society from the 1520's and into the seventeenth century. Thus, as Cremin says "Both the renaissance and the reformation cast Everyman, for the first time in history in the role of student; and the printing press made that role feasible" (Cremin, 1970, p. 39).

But, because religion does not exist in a vacuum, it is difficult to attribute the only driving force behind adult literacy to religion. In addition to religion, Lawrence Stone has suggested that other survival considerations during this century may have played a part in encouraging literacy (Stone, 1964, p. 42). Reading was a means

frequently used to test if one were a member of the clergy or, at least, studying for the clergy. Even criminals who could read could claim benefit of the clergy and receive a reduced sentence. Stone has estimated that in the early 1600's approximately 47% of the criminal population in London could read and that for certain crimes this meant being branded with the Tyburn mark; whereas, those who could not read and, therefore, claim benefit of the clergy were hung (Stone, 1964, p. 43). On the basis of the court's application of this procedure, Stone estimates that the level of literacy in London among adult males in the early 1600's must have been slightly greater than this 47%.

Printing as a Means to Adult Education

As the religious motive for reading developed in the early sixteenth century, there was also an increased demand to print and disseminate knowledge as a result of increased commerce and a resulting need for technical information to facilitate this trade and to produce goods for trade. Thus, those involved in commerce, in order to be more competitive, had to develop and to master new methods and techniques to maintain the business process. Because institutions did not exist to meet this need, books and private teachers provided the needed skills and information.

The level of publication in England increased the proliferation of ideas, the rise of experimental science, the widening of education. The perceived and the actual utility of knowledge and books resulted in books and knowledge being able to serve more than just select classes in society, and it was during the sixteenth century that Louis Wright says that education "came to be a goal desired of the

generality of man" (Wright, 1935, p. 17). Thus, **Wright** assigns the origin of the middle class value of education to sixteenth century England.

Wright proposes that it was during the sixteenth century that the how-to-do-it book originated or as he says "The citizen had less time and means than the courtier for attaining his ends, he required speedy methods of instruction and usable compendiums of facts. The answer to his demands was the handbook . . . the Tudor and Stuart counterpart of the modern fifteen-easy-lessons which lead to bourgeois perfection" (Wright, 1935, p. 121).

There exist some generalized estimates of the numbers of books published during the sixteenth century. In 1520, the Oxford bookseller John Dorne had a stock of 1952 titles in his shop (McLean, 1972, p. 100). In 1585, Roger Ward at Shrewsbury had a stock of 2500 books (Bridenbaugh, 1968, p. 342). Using the Sort Title Catalog kept by the Stationers' Company Bennett reports that 2760 titles were published between 1558 and 1603 (Bennett, 1965, pp. 269-270). These publications can be divided in the following categories: 40% religious; 25% literature; 10% law; 10% history, geography, travel, and news; 8% science; and 5% books on commerce, economics, education (Bennett, 1965, pp. 269-270).

The quality of these publications varied from poor to superior. In 1603, some critics claimed that books were too plentiful: "No man has leisure enought to read the infinite number of learned and godly books that are extant; the printers' and booksellers' shops are clogged with stuff fit for waste paper or with amorous pamphlets or books full of sin and abomination or merely of books of dreams and fancies" (Bennett, 1965, p. 268).

Books published during the sixteenth century covered a broad series of topics including: surveying, agriculture, gardening, sports, navigation, magnetism, military arts, language, math, science and medicine to name a few. The first Latin-English dictionary was compiled by Thomas Eliot in the 1530's and was for the use of youth and adults. It apparently appealed to a wide circle of readers and formed the basis of subsequent compilations.

Many Italian texts on trade and business procedures were translated into English and printed in England as early as 1543. In those texts dealing with accounting procedures Italian terms such as debit, credit, inventory, journal, and cash were applied in English. John Weddington's 1567 text on accounting gave instruction in the Italian method of double entry accounting and was the first English text in business to use Arabic numerals in example columns as well as in the narrative (Charlton, 1965, p. 261). Thomas Masterson's book on math was intended to benefit merchants because Masterson asked and answered questions relating to paying, receiving, buying, selling, and bartering. In 1588, the first shorthand manual in English was published by Timothy Bright. Very few copies of these business manuals have survived because they were simply used until they fell apart.

During the reign of Elizabeth I there was a continuing demand for medical books for the professional and for the average citizen. Many cheap small books which gave the layman rules of hygiene and diet, simple remedies made from herbs and flowers, how to avoid the plague, and were to be used when no physician was available were published. Several technical manuals were translated from sources

outside of England or written and published in England for the professional. Even a few books on psychology and mental health such as the A Treatise on Melancholy published in 1586 were available.

For lawyers, magistrates, or justices of the peace there were several series of brief legal texts which provided instruction on legal and court procedures. Although formal legal education was provided at the Inns of Court, McLean indicates that by the end of the sixteenth century the essentials of law were frequently mastered from text books published during the century (McLean, 1972, p. 104). In 1596, Edmund Coote published The English School Master which Louis Wright has called an important text in the history of self education (Wright, 1935, p. 157). Coote's text included reading, spelling, grammar and religious instruction. Although it could be used as a text for teaching children, Coote also intended it for illiterate or barely literate adults. In the preface he says ". . . And to such men and women of trade, as tailors, weavers, shop keepers, seamsters, and such others as have undertaken the charge of teaching others" (Bridenbaugh, 1968, pp. 317-318). Coote indicated that mastery of his manual would enable the reader to fit children at the ABC stage for entrance into the grammar schools, and also aid those older persons who were ignorant of Latin and ashamed to write to their best friends (Bridenbaugh, 1968, pp. 317-318). Between 1596 and 1638 Coote's text had been reprinted twenty-eight times.

It should be remembered that those publications just discussed were written in English for the general population and not in Latin for a scholarly audience only. Those limited examples noted above

do indicate that self help, informational books were available and were apparently purchased by citizens otherwise printers would have not been able to continue printing. However, only very gross estimates of the extent of their use for self instruction by adults can be made. These portable, cheap printed books affected the acquisition and understanding of information in two significant ways. First reading became an individual activity which was done silently and in isolation. McLean believes this reinforced individuality by allowing one to select and read information by himself which resulted in divergent interpretations of texts, and, secondly, these publications gave an increased validity to the written word and sometimes a false authority to the written word (McLean, 1972, p. 25).

Three Individuals Who Contributed to Adult Learning

Although many individuals contributed to the education of the adult population in England during the sixteenth century, I would like to discuss briefly the contributions of three persons: Robert Recorde, John Dee, and Thomas Hood. These men promoted teaching and learning and made a number of contributions to the education of adults.

Robert Recorde was born in 1510 and died in 1558 the same year that Elizabeth I came to the throne. He studied at both Oxford and Cambridge and was a Doctor of Physick or a medical doctor. During the reign of Edward VI he served as court physician. Recorde was a superior mathematician and competent teacher. His genius lay in his ability to popularize math and science as it existed in the sixteenth century for the masses. Recorde believed that civilization could only advance through the creation and use of knowledge. He held the

view that national greatness for England lay through technical knowledge, and he, therefore, set about to educate his countrymen. He intended to make the knowledge of mathematics available to all Englishmen who were literate in the form of four texts on math which were in English and were published between 1542 and 1557. His major concern was teaching applied mathematics, and he sought to make England more competitive in mathematical theory and practice. His purposes were to arouse interest in the many useful applications of mathematical knowledge, and to train his students that they would at the earliest possible moment be able to employ their new learning in solving specific problems (McLean, 1972, pp. 131-132). The four texts on mathematics that he published were: The Ground of Arts which dealt with basic arithmetic and was published in 1542. It was the first text on mathematics written in English, and eighteen editions were printed in the sixteenth century (Stillwell, 1970, p. 71). Taylor says that The Ground of Arts opened the way to self education for the new class of technicians (Taylor, 1970, p. 313). The Pathway to Knowledge published in 1551 was the second in the series and dealt with geometry. The Gate of Knowledge continued the discussion of geometry. The Castle of Knowledge published in 1556 discussed astronomy and mathematics. The Whetstone of Wit discussed algebra and was published in 1557. Recorde died while working on The Treasure of Knowledge. These books were written in dialogue form and each book advanced to a more demanding level of knowledge so that together the series provided a comprehensive groundwork in mathematics.

Recorde also served as a technical consultant to the Muscovy Company where he taught the application of math and astronomy to

navigation for the employees of the Muscovy Company. Consequently, Recorde helped train the first generation of English navigators and in doing so broke tradition and taught mathematics in English. Bennett reports that in his teaching Recorde set a standard that others in the century could not rival; he wrote in clear English and used the method of question and answer so skillfully that his books and influence were a dominating factor on mathematical thought and teaching for well over a generation (Bennett, 1965, pp. 196-197).

With Robert Recorde's death in 1558, John Dee became the most influential teacher and consultant on math and science for the following twenty-five years. Like Recorde, Dee also served as a mathematical and science advisor to English seamen and trading companies. Because of his interest in publishing in English, Recorde's influence was extended beyond his teaching through his publications; however, Dee's influence resulted from his lectures, consulting with individuals and companies, and his influence on a number of persons who were his pupils. Dee was not interested in publishing in English and published the majority of his mathematical and scientific writings in Latin.

Dee was born in 1527 and attended Cambridge. Although Dee called himself doctor there appears to be some disagreement as to whether or not the doctorate was ever awarded. During the period 1550 to the 1580's Dee advised and taught applied mathematics to English seamen. Sir Lionel Duckett asked Dee to examine and instruct those involved in Martin Frobisher's voyage to the new world in 1576. To do this Dee took up temporary residence at the Muscovy House in London. In 1570, he wrote a preface to Henry Billingsly's English translation

of Euclid. This text represents the first translation of Euclid into English. Dee's preface discussed the application of mathematics to various skilled arts and crafts. It argued for the application of the scientific method; Dee stated that "The chief reason for the translation of Euclid into English was to make the science of geometry available to those without university training or skill in Latin in order that they might put this knowledge to practical uses for their own good and that of the commonwealth" (Johnson, 1937, p. 170). Taylor in her study of English mathematicians of the sixteenth century indicates that "The impact of Dee's preface upon young men of the middle class, sons of tradesmen, and craftsmen was very great" (Taylor, 1970, p. 170).

Dee used his private library and laboratories at Mortlake for educational and instructional purposes. In 1583, Dee cataloged his library holdings and wrote that he had almost 4000 books and manuscripts and that printed books amounted to 1000 or a fourth of the total holdings (French, 1972, p. 43). However, McLean reports that in the 1580's Dee's library included 170 manuscripts and 2500 books (McLean, 1972, pp. 94-95). Apparently, Dee concentrated on collecting books and manuscripts relating to all of the existing sciences because his library has been called the greatest scientific library at that time in England. Dee's library must have been more complete in its holdings than the small college libraries at Oxford and Cambridge. In comparison, French reports that in 1583 one college library at Cambridge had about 451 books and that in 1589 Corpus Christi College at Oxford had about 379 volumes (French, 1972, pp. 44-45). McLean speculates that Dee's library had a greater impact on the application of math and science than either of the universities because

he placed his library and knowledge at the disposal of all who came to seek it, and included among his pupils ordinary seamen and technicians as well as the aristocracy (McLean, 1972, p. 134). Thus, Dee's contribution resulted from his extensive library, his instruction in the application of math and science, and although his influence was greatest on scholars and sixteenth century scientists, he also taught and advised practitioners of various social levels and promoted practical knowledge and learning among these groups.

The classification of Recorde and Dee's contributions to teaching and consulting from a twentieth century perspective of whether it should be classified as higher education, adult education, or technical education is irrelevant. Both, however, made contributions in all three areas, and the majority of their audience were adults for whom education was secondary to their productive role in society.

Another example of continuing education opportunities for adults were the public lectures on math given in London from 1588 until 1591. During the 1580's several persons in London had advocated that a lecture on applied mathematics be started in London. In 1588, under the threat of the Spanish invasion, Sir Thomas Smith and Lord Lumley raised funds to hire a lecturer in math. Although the lectures later involved a broader clientele, originally they were to focus on the military applications of math for the captains of the militia and for seamen. Later, after the defeat of the Spanish Armada the lecture focused more generally on the application of math to a number of practical areas and the audience included craftsmen and artisans.

Thomas Hood who held a doctorate from Cambridge was selected as lecturer. This lecture series was the first publicly

endowed lectureship in math in London. The lecture was first held in Sir Thomas Smith's house and later moved to the Staplers' Chapel which was in the commercial center of London.

Hood published a series of inexpensive pamphlets which contained the fundamental points that he explained and demonstrated in his lectures. It has been estimated that these may have sold for only a penny or two (Johnson, 1937, pp. 200-201). Hood was not the scholar that either Recorde or Dee were, but he imitated the teaching techniques of Recorde and emphasized the mastery of the fundamentals before progressing to more advanced levels of instruction and demonstration. His texts like Recorde's were written in the form of questions or dialogues, and his writing was clear and precise (Johnson, 1937, p. 200). Hood's lectures were intended to stress practical applications of mathematics; however, he apparently set out in his initial lectures to instruct his clientele in the basic elements of math, geometry, and astronomy. From this, he then passed on to the application of these to the solution of practical problems in surveying and navigation. Johnson says that Hood kept the needs of his pupils constantly in mind, and adapted his teaching to the demands imposed by an audience made up almost wholly of eager artisans, soldiers, and seamen, who had had little scholarly training but desired useful knowledge (Johnson, 1937, p. 200).

The Society of Antiquaries

Possibly one of the oldest institutional forms of adult education has been the special interest group which organizes to promote knowledge and learning in specific areas of interest. Sixteenth

century England is no exception in that many such organizations probably existed, but the Society of Antiquaries is one of the more well known groups that promoted the study of English history and the collection of items relating to English antiquity. The Society of Antiquaries was founded in 1572 and was disbanded about 1604. Members were from the upper classes on the basis of education, rank, or income. Although the members represented a number of professions, lawyers were the single largest group of members. Meetings were usually scheduled in London during court terms. At each meeting two questions were usually proposed for study and discussion, and at the next meeting each member was expected to give his opinion on the topics. The text of the discussions were recorded and kept by the society. The topics were discussed from a historical perspective, and it was the norm that evidence be presented to support positions taken or argued by each member.

The purpose of the society was to study the historical development of the laws, customs, and institutions of England. Sir Robert Cotton who preserved a number of historical documents, among them early manuscripts of the epic poem Beowulf, was a member of this group. The membership sought to study the past in order to provide an understanding of the present. The methods used by the society were forerunners of modern historical research; it was a process for studying history that was not being used at the universities at that time. Fussner suggests that the Society of Antiquaries represents "perhaps the earliest example in English history of a learned society with formal membership, set rules of procedure, and institutionally defined purposes" (Fussner, 1962, p. 94).

Gresham College: An Adult Education Institution

One institution contributing to the education of adults in sixteenth century England that has not been studied to any great extent is the private school. As an institutional form the private instructor is probably among the oldest form of adult education institutions, and sixteenth century England is no exception. Apparently, private teachers in London taught almost any subject or skill in demand by the citizens. The subjects included the study of military fortification and mining, weaponery, mathematics, drawing, writing, accounting, shorthand, horsemanship, dancing, and languages both ancient and modern (Charlton, 1965; Simon, 1966).

These private teachers charged a fee, but one significant example of an institution providing instruction to adults through lectures and demonstrations for which no fee was charged is Gresham College. In the 1570's, the idea of Gresham College took shape in the will of Sir Thomas Gresham, but it was about 1597 before the college was organized and began conducting daily public lectures in London. Gresham College was conceived and originated in the sixteenth century, but most of its contribution to education and learning came in the seventeenth and eighteenth centuries.

Gresham had been born in 1519. His father was a financial advisor and agent to Henry VIII. In the 1550's Gresham assumed his father's role as manager of the king's financial affairs in Antwerp. Later he was advisor and financier to Edward, Mary, and Elizabeth. Ward calls him the richest commoner in England (Ward, 1740, p. 28). He was a graduate of Cambridge but had also served an apprenticeship as a Mercer. Thus, Gresham's practical and business experience

apparently greatly influenced his notion of the content of the lectures for the college that he endowed.

In 1575, Gresham established the legal requirements and financial support for Gresham College which was to hold lectures in his house on Bishopsgate Street. The college was to begin operation at his and his wife's death. Gresham died in 1579, but his wife lived until 1596; therefore, the College did not began offering lectures until 1598. Gresham's house was a sprawling palacial mansion which included lecture rooms, rooms for laboratories and libraries, and living accomodations for the seven professors who were to live and lecture there.

Prior to 1575, Gresham had asked the city of London to provide land on which he would build a building for use as a trading center for London. This building, which came to be called the Royal Exchange after a visit from Elizabeth I, also included a number of shops and offices, and in his will he stipulated that the revenues from the Royal Exchange be used to operate Gresham College and to pay the seven professors. In 1581, the yearly rents and profits from the Royal Exchange amounted to seven hundred fifty one pounds and five shillings. The will required the administration of the College jointly by the Mercer's Company and the city of London. Every fifty years these trustees were to ask the crown to renew the life of the corporation otherwise the estates would revert to Gresham's heirs.

The seven lectures were open to the public and were intended to make a knowledge of the arts and sciences and the application of this knowledge to practice available to citizens. Unlike the universities, lectures had to be read in Latin in the morning and in

English in the afternoons so that those citizens of London who did not understand Latin would benefit, whereas, those who were knowledgeable in Latin and foreigners might benefit from the Latin lectures in the mornings. Apparently, Gresham did not specify this, but it was a decision of the trustees based on their understanding of Gresham's intent. The trustees of the corporation invited both universities to nominate lecturers for each of the seven positions, but once hired the lecturers were reminded by the trustees that the participants would "Be merchants and other citizens and that lectures should not, therefore, be read after the manner of the universities; rather the lecturer should cull out such heads of his subject as may best serve the good liking and capacity of the audience" (Simon, p. 388). However, Ward implies that this injunction was primarily directed to the lecturer in law (Ward, 1740, p. vi). In another instance procedural instructions were given to the lecturer on divinity. He could argue against false ideas with " . . . scripture first, then with the content of antiquity, and lastly with schoolmen and chief writers" (Ward, 1740, p. v). Specific instructions were given to the lecturer in medicine. He should first discuss physiology, then pathology, then therapeutic processes versus the exposition of some part of Galen or Hippocrates so that the information would not be disjointed or delivered out of a rational order or sequence and would, therefore, be more beneficial to the audience (Ward, 1740, pp. vii-viii).

The seven professors were provided living quarters and paid fifty pounds per year. In return they were expected to lecture one day per week; one lecture in Latin in the morning from eight until

nine o'clock and in English in the afternoon from two until three o'clock. The seven areas of study were: law, rhetoric, divinity, music, medicine, geometry, and astronomy. Thus, one lecture was read each day Monday through Saturday except the music lecture and demonstration which was also held on Mondays and Saturdays. The lectures were to include experiments when possible and were to be followed by discussions. In the sixteenth century tradition at the universities the lecturers were not to be married. The proscribed times of the lectures during the year usually followed the terms of court in London.

The trustees indicated that the purpose of the lectures were that they should be performed " . . . In that manner, as may most tend to the glory of God, and the common benefit of the people of this city, which we doubt not to be the principal ends of the founder in ordaining the lectures" (Ward, 1740, p. v).

Initially to show no partiality the trustees hired three lecturers having degrees from Oxford and three having degrees from Cambridge and the seventh had degrees from both universities and was recommended by Queen Elizabeth I. However, for the next hundred years or so the trustees did not have to seek recommendations from either Oxford or Cambridge because applications from each university were made as soon as a vacancy occurred.

The lecturers, for over a hundred years, represented the most learned men in their fields. For example, the first lecturer in geometry was Henry Briggs an imminent mathematician of the late sixteenth century and the early seventeenth century. Briggs lectured at Gresham College until about 1619 when he accepted the first endowed

lectureship in mathematics at Oxford. This practice of employing recognized authorities in each area continued through the seventeenth century as exemplified by Christopher Wren's appointment in 1657 to the professorship of astronomy.

Apparently, public interest and participation was at an acceptable level. In 1706, about 100 years after the college had been founded a group of young men filed a suit against the trustees charging that Gresham's will was not being carried out. The suit argued that the lectures were not being read at consistent times; that when a term began in the middle of the week the lectures should also begin in the middle of the week instead of waiting until the next whole week; and that the lectures should be read seven days each week instead of six. The professors rejected this argument and claimed that they were operating on the basis of precedent and tradition. It was finally agreed that the lectures would be read consistently at specified times each day and that they would be read during half weeks of terms, but the professors were not required to read the lectures continually without breaks between the terms nor to read on Sundays.

Wright has said that Gresham's ideal in establishing Gresham College was to combine humanistic and utilitarian learning so that the intelligent citizen in London could benefit (Wright, 1935, p. 65). It was to deal with some of the practical aspects of education not being dealt with at the universities and to open this knowledge to those who had not had the advantage of attending the universities (Wright, 1935, p. 64). In this role Wright calls Gresham College an example of sixteenth century university extension, and the first

institution devoted to popularizing learning for the benefit of the middle class (Wright, 1935, p. 65). McLean takes a similar position when she says that Gresham College was an extension of the universities to London, rather than a rival institution. It differed from the older universities only in emphasis; in the fact that the most brilliant of its early professors happened to be scientists and mathematicians, and in its more flexible methods of teaching (McLean, p. 167). Other differences included its being open to the public and serving a broader spectrum of the population--both young adults and adults, and its fees.

But, Gresham College represented more than a teaching institution. It also became a place where scientist, engineers, and humanists could meet informally for discussion and research, and in this capacity, it promoted the development of scientific research and the application of this research. In this role Gresham College had an impact on the eventual organization of the Royal Society. Many of those who started the Royal Society in the early 1660's were Gresham professors, and the Royal Society met at Gresham College during the later part of the seventeenth century except during a period of several years immediately after the great fire in 1666. Thus, Gresham College served to encourage and popularize research and scientific investigation and in doing this continued a role performed by Recorde, Dee, the Muscovy Company and others. Because of this contribution to teaching and promotion of learning Hutchinson has noted that Gresham College is an instance of what would be called adult education in the twentieth century (Hutchinson, 1976, p. 38).

Who attended and how many persons attended lectures at Gresham College has not been investigated fully and there seems to be some variation in the estimates ot these points. Johnson has proposed that the lectures were widely patronized by the skilled artisans, expert mechanics, and navigators and that the Gresham professors were always in close touch with the practical workers in many fields of applied science (Johnson, 1937, p. 264). For example, it is said that the master carpenter Richard More advised his fellow artisans to go to Gresham College every Thursday for the geometry lecture (Taylor, 1970, p. 50). Johnson also notes that from its origin there is evidence of a close association between the teaching and investigations of the Gresham professors and the sea captains, shipbuilders, and administrative officials of the English Navy (Johnson, 1937, p. 429).

Summary

Thus, in these brief examples of adult education we have some general indicators of the opportunities for education and learning among adults in the sixteenth century. Specifically, the evidence indicates that values and philosophical positions regarding education in general and including adult education in specific were developing in the sixteenth century and have continued to serve as idealized values into the twentieth century. Secondly, this evidence suggests that the middle class's emphasis on education in modern times began in sixteenth century England. Thirdly, we have indications that levels of self directed learning must have been fairly high based on the evidence of the printing of books and private schools. Additionally,

there is evidence of groups organizing themselves to promote the study of specific topics, and, finally, the sixteenth century marks the establishment of a major institution whose purpose was to promote knowledge and learning among adults and scholars as well as master craftsmen and artisans.

Gresham College was an adult education institution. It extended opportunities for learning in the vernacular to the middle class, and it meets Verner's definition of an adult education institution. Although it may be the first institution for adult education in England which meets Verner's definition, only continued research will varify it or identify earlier institutions. As Hans Zetterberg has observed in Museums and Adult Education; "The present quest for adult education is not a passing fad. It is a new, somewhat unexpected focus for the old battle for equality" (Zetterberg, 1969, p. 9). Adult education is as old as history; what is modern in Verner's use of the concept modern adult education is the term itself, the development of adult education as a discipline for research and practice, and the growing involvement of the middle and lower classes since the sixteenth century.

But more importantly, what do the adult education topics that we have examined here from the sixteenth century say to the adult education practitioner in 1980? It is quite possible that we in the United States and England are in a position comparable to that in England in 1580. The points that have been made in this paper suggest that two factors from sixteenth century England have served as the underlying foundation for all education and specifically for adult education into the twentieth century. These are the idealized notion that

every adult should be literate and the technology of printing to disseminate knowledge. These have been aided and supported by other innovations, but without these foundations adult education would probably not exist at the level that it does today. Nineteen eighty is comparable to 1580 in England because, as Toffler suggests, electronic technology is being developed and implemented to extend this value on reading and learning, and to extend the technology of printing so that the availability of knowledge to the individual will again be magnified many times. In the last quarter of the twentieth century we may be experiencing the zenith of printing and the dissemination of knowledge through books. Presently, I have access to two university libraries in Denton. In the Dallas-Fort Worth metroplex I have access to another four major university libraries, or I can visit almost any library in the country, but by the year 2000, I may be able to have access to any major library in the country almost instantaneously in my home. It is quite possible that this impact on the dissemination and acquisition of knowledge will result in a similar number of innovations in adult learning as were experienced in the sixteenth and early seventeenth centuries in England. Moreover, these innovations may or may not be extentions of existing institutional forms. Formalized adult education in instutions will probably increase, but so will options for self directed learning so that the ratio of institutional adult learning to self directed adult learning may not change. We have some insight as to how sixteenth century England responded, but the question confronting practitioners today is how will we respond?

REFERENCES

Bennett, Henry Stanley. English books and readers: 1558 to 1603. Cambridge: Cambridge University Press, 1965.

Bridenbaugh, Carl. Vexed and troubled Englishmen: 1590-1642. New York: Oxford University Press, 1968.

Burke, James. Connections. Boston: Little Brown, 1978.

Campbell, Duncan. Adult education as a field of study and practice. Vancouver, B.C.: The University of British Columbia, 1977.

Charlton, Kenneth. Education in renaissance England. London: Routledge and Kegan Paul, 1965.

Coote, Edmund. The English schoolmaster. London: Ralph Jackson and Robert Dexter, 1596. Facsimile by Scholar Press, Meston, England, 1968.

Cremin, Lawrence. American education: The colonial experience 1607-1783. New York: Harper Row, 1970.

French, Peter J. John Dee: The world of an Elizabethan magus. London: Routledge and Kegan Paul, 1972.

Fussner, F. Smith. The historical revolution: English historical writing and thought 1580-1640. New York: Columbia University Press, 1962.

Grattan, Hartley. In quest of knowledge: A historical perspective on adult education. New York: Association Press, 1955.

Hutchinson, Harold. Sir Christoper Wren: A biography. New York: Stein and Day, 1976.

Johnson, Francis. Astronomical thought in renaissance England. Baltimore: Johns Hopkins Press, 1937.

Laqueur, Thomas. The cultural origins of popular literacy in England 1500-1850. Oxford Review of Education, 1976, 2, 255-275.

McLean, Antonia. Humanism and the rise of science in Tudor England. New York: Neale Watson Academic Publications, 1972.

Schroeder, Wayne. Adult education defined and described. In Robert Smith, George Aker, and J.R. Kidd (Eds.), Handbook of adult education. New York: Macmillan, 1970.

Simon, Joan. Education and society in Tudor England. Cambridge: Cambridge University Press, 1966.

Stillwell, Margaret B. The awakening interest in science during the first century of printing: 1450-1550. New York: The Bibliographical Society of America, 1970.

Stone, Lawrence. Literacy and education in England: 1640-1900. Past and Present, February 1969, 42, 69-139.

Stone, Lawrence. The educational revolution in England, 1560-1640. Past and Present, July 1964, 28, 41-80.

Taylor, Eva Germaine Rimington. The mathematical practitioners of Tudor and Stuart England. Cambridge: Cambridge University Press, 1970.

Trevelyan, George Macaulay. English social history: A survey of six centuries Chaucer to Queen Victoria. New York: Longmans, Green and Company, 1942.

Trevelyan, George Macaulay. England under the Stuarts. (Tenth Edition.) New York: Putnams and Sons, 1922.

Verner, Coolie. Pole's history of adult schools: A facsimile of the 1816 edition with an introduction and bibliographical notes. Washington, D.C.: The Adult Education Association of the USA, 1967.

Ward, John. The lives of the professors of Gresham College: To which is prefixed the life of the founder, Sir Thomas Gresham. A facsimile of the London edition of 1740. New York: Johnson Reprint Corporation, 1967.

Wright, Louis B. Middle class culture in Elizabethan England. Chapel Hill: The University of North Carolina, 1935.

Zetterberg, Hans. Museums and adult education. New York: Augustus Kelley, 1969.